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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,232	07/31/2003	John E. Schreiber	Serie 6041	2544

7590 04/12/2005

EXAMINER
DOERRLER, WILLIAM CHARLES

ART UNIT	PAPER NUMBER
3744	

Air Liquide
Suite 1800
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DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/632,232	SCHREIBER ET AL.	
	Examiner	Art Unit	
	William C Doerrler	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4,9,10,14-18,27,28,31 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by McKee.

McKee shows a system for producing solid carbon dioxide with ozone dissolved in the carbon dioxide. In regard to the water content of the product, it is noted that in line 100 of page 2 that McKee uses "industrial carbon dioxide" which does not contain water, and no water is added in the disclosed steps. In regard to claim 10, line 75 of page 1 states that .01% of the product produced is ozone. In regard to claim 27, line 97 of page 1 states that 10% of the oxygen stream used is converted to ozone prior to being absorbed into the carbon dioxide with the oxygen remaining as an "inert gas". Lines 38-41 of page 2 state that the contacting of the carbon dioxide with ozone may occur anywhere in the system.

Claims 1,5-8 and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese 07-102240 reference from the IDS (machine translation enclosed herein).

The 07-102240 Japanese reference discloses that "ozone can be remarkably shut up into dry ice" (line 1 of the "operation" translation). The ozone is released as the dry ice

sublimates ("since ozone is also evaporated together with sublimation of dry ice", line 3 of the translation of the Operation section. Figure 2 shows a block containing dry ice and ozone. Figure 1 shows a powder of dry ice and ozone.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-8,11-13,19-24,26 and 29-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKee.

McKee discloses the production of dry ice with entrained ozone. McKee does not state what form the dry ice is in or the use of the dry ice. However applicant's specification, specifically line 12 of page 12 and line 8 of page 3, state that "the form of blocks,

pellets, flakes, powders, and other possible forms (are) well known in the art" (the are being added) and that carbon dioxide is "frequently used as an expendable refrigerant", respectively. It therefore would have been obvious to one of ordinary skill in the art at the time of applicants' invention to use the device of McKee to produce dry ice in blocks, pellets, flakes or powders to provide cooling to perishable items to ensure a high quality product that is free of odors. In regard to claims 11 and 41, the use of less ozone is seen as a matter of obvious design choice for an ordinary practitioner in the art depending on the intended use and duration thereof. In regard to claim 22, the use of a lower pressure is also seen as a matter of design choice for an ordinary practitioner in the art to maximize the economy of the process (i.e. lower pressures are easier to obtain).

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over McKee in view of Kiyonaga et al.

McKee discloses applicants' basic inventive concept, injecting ozone into carbon dioxide before freezing the mixture, substantially as claimed with the exception of injecting the ozone into an expanding stream of liquid. Kiyonaga et al show the injection of a gas into an expanding stream of liquid to be old in the injection and fluid mixing art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention fro the teaching of Kiyonaga et al to modify the process of McKee by injecting the ozone into the liquid carbon dioxide where the carbon dioxide expands to improve the fluid mixing and absorption of the gas into the liquid.

Claims 2-4,9-13 and 36-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '240 Japanese reference in view of McKee.

The '240 Japanese reference discloses applicants' basic inventive concept, a dry ice with entrapped ozone, substantially as claimed with the exception of forming the dry ice without water. McKee shows the forming of dry ice without water to be old in the dry ice art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of McKee to modify the dry ice of the '240 Japanese reference by forming the dry ice without water to prevent wetting of the treating foodstuffs. McKee also teaches the ozone ranges as claimed as described above.

Response to Arguments

Applicant's arguments filed 2-10-2005 have been fully considered but they are not persuasive. Line 41 of page 2 of McKee states that the ozone may be presented at any point in the dry ice producing system. This will include contacting the liquid carbon dioxide with gaseous ozone. The ozone in McKee is produced at high pressure. It is injected at high pressure into the carbon dioxide because at the shown injection point the carbon dioxide is at high pressure. Since McKee states that the ozone may be injected anywhere, the pressure for injecting the ozone need not be high if the pressure for the carbon dioxide is no longer high. Since McKee clearly shows the solidification of liquid carbon dioxide and states that the ozone may be injected anywhere in the system, the injection of gaseous ozone into liquid or solid is seen as taught by McKee. Injecting the solid will also enable a drop in pressure of the ozone since carbon dioxide entering

the ozone supply will not be a problem if the carbon dioxide is at low pressure. Line 10 of page 1 states that dry ice is used to cool food products. This leads one of ordinary skill in the art to use the dry ice of McKee (which will have ozone entrained therein) to cool food products. The fact that the ozone of the reference is produced at exceedingly high pressure is not seen to negative the teaching that ozone can be injected into a carbon dioxide solidification process at any point since there are many known methods of producing ozone. Even if little ozone is left in the produced dry ice, the claimed structure is still seen as being met since applicant has claimed an upper limit of 100 ppm of ozone in the dry ice. Even if three molecules of ozone are entrained in a 10 pound block of dry ice in the process of McKee, the structure of claim 1 will still be met.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on (571) 272-4808. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William C Doerrler
Primary Examiner
Art Unit 3744

WCD